

## Thresholds and Monitoring

### ESTIMATING SUMMER LEAFMINER OUTBREAKS FROM SPRING SAMPLES

Stephen D. Cockfield  
Okanogan Valley IPM, LLC, Brewster, WA

*Abstract:* Western tentiform leafminers were sampled for five years in an orchard of 20-year-old Red Delicious trees. Samples of the first and second new generations were gathered. Between the two generations, leafminers increased by a factor of 5.7-11.3 in four of the years, but increased by a factor of 29.9 in one of the years. The increase depended on fecundity and growth of new leaves between leafminer generations. Measurements of leaf growth helped determine estimates of fecundity, which agreed with previous laboratory estimates. Leafminers can be occasional but serious pests and need control action at oviposition. Therefore, advanced warning of outbreaks is necessary for IPM decisions.